GUIDELINES TO PREPARE AN ENVIRONMENTAL IMPACT STATEMENT OF THE PROPOSED MACKENZIE DELTA GAS DEVELOPMENT

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OVERVIEW SUMMARY

Describe the project and the major conclusions of the Environmental Impact Statement. This overview should be directed towards a wide public audience.

PROJECT PROPOSAL

2.1 Rationale

State reason(s) why development is proposed.

Document trunk line demand for natural gas and discuss means to satisfy that demand.

Discuss role of proposed facilities in the network of facilities needed to extract, process and transport natural gas.

Discuss whether the proposed facilities could or would be integrated into potential development proposals for other gas reservoirs in the Mackenzie Delta/Beaufort Sea area, or influence any other type of development (whether or not they are under the proponent's control). Project expected length of time facilities will be in use.

2.2 Alternatives

All project alternatives including those for logistics support, whether they be in location, design or time schedules, should be included. In a general way this subsection should describe the constraints and advantages of these alternatives, and indicate the depth of study on which the alternative solutions were rejected.

2.3 The Industrial Proponent Declaration

The individual industrial proponent(s) must be identified and take full responsibility for all statements in the Environmental Impact Statement.

2.4 Plans and requirements

Describe the proposed development and its associated projects, programs and facilities in terms of a) lands required, structures and facilities planned, and b) operational and maintenance activities forecasted during the planning, construction and operational phases of the undertaking. For further guidance in formulating the project description refer to Appendix A.

It should be noted that the proponent plans should adhere to existing federal regulations, guidelines and legislation. The appropriate regulating agency should be consulted.

Show on a map of appropriate small scale and in relation to geographical features:

(a) the gas contract area, the location and status of wells within two miles of the contract area, and all leases, acreages, roads, airstrips, borrow pits, buildings, camps, staging and storage areas;

(b) the proposed pipelines, well sites, plant sites, campsites, borrow pits, roads, airstrips, dredging, water sources, waste and sewage disposal sites, sumps, fuel storage areas, supply-staging areas, connections to the trunk pipelines and all other facilities within and without the lease area.

Document estimated plant emissions and effluents in terms of quantity and characteristics.

Show on a map of appropriately large scale a schematic diagram for the gas processing plant(s) and associated facilities.

Provide a time-table of projected dates and durations of on-site activities.

ENVIRONMENTAL INTERACTION ON SOCIAL AND ECONOMIC VALUES OF THE PROJECT AREA

The assessment of potential impacts shall be made on the basis of referenced information collated from existing sources and on information obtained through research specifically related to the proposed development. Information that may be required to carry out a satisfactory assessment shall include but shall not necessarily be restricted to topics on the following pages. Potential environmental impacts in the area to be affected shall be discussed in terms of existing environmental, economic and social values and shall be identified in the design, construction, operation and abandonment phases of the proposal. These values may be considered as international, national, regional, local or site-specific. The information sought applies to all aspects, activities and facilities of the gas development system including drilling, production and plant processing. Further, all envisioned ancillary and auxiliary facilities such as roads, borrow areas, docks, landing areas, airstrips, pumping and compressor stations, communication and maintenance facilities, including campsites, are to be considered. Options and measures available to avoid, minimize or mitigate harmful effects and to enhance beneficial effects shall be investigated and discussed under each topic.

Impacts identified herein as the more important shall be discussed in detail in Section 4. Sections 3.1 to 3.8 shall be discussed in terms of the anticipated environmental impacts.

3.1 Climate

Consider and discuss the following: temperature (daily and seasonal variations and extremes); temperature inversions (type, frequency and intensity) as they relate to dispersal of atmospheric pollutants; winds (velocity, frequency, direction and duration of critical wind speeds); precipitation (kind, amount, duration and frequency); incidence of fog (kind, duration, frequency); incidence of critical meteorological phenomena resulting from a combination of effects of its components (windchill, drifting snow, freezing rain); air quality and air pollution potential.

3.2 Terrain

Consider land suitability and land capability. The information shall be presented on maps of sufficiently large scale. Show on a composite map, landforms, permafrost, ice content, bedrock formations, earthquake potential, surficial deposits, mineral resources and soils in terms of their suitability for the proposed development.

3.3 Hydrology

Consider watershed characteristics (relief, vegetative cover); overland flow (drainage channels, streams); ground water (subsurface drainage patterns, water table, seepage, icing conditions).

Consider quantity of surface water in the seasonal context (seasonal peaks, floods, storm surges, break-up and freeze-up characteristics and ice jams).

Consider stream characteristics for identified problem areas (stream flow, channel dimensions, slope, bank and bed characteristics, scour potential and stream behaviour in terms of shifts in channel).

Consider quality of water (levels of suspended sediments, dissolved oxygen, nutrients, heavy metals) for identified important aquatic habitat.

3.4 Flora

Consider the distribution and abundance of plant communities.

Consider plant communities by species composition and abundance, and describe the susceptible terrestrial and aquatic plants within the affected area.

Consider effectiveness of different plant communities as insulators of the ground (lichens, mosses and higher plants including trees).

3.5 Fauna

Consider aquatic and terrestrial animal populations, seasonally utilizing the area and the phases of their biology affected by the development. Consideration should also be given to historic trends in the use of the area by animal populations.

3.6 Public Participation

Outline the results of public discussions that have taken place on environmental effects of the project.

3.7 Existing Land and Resource Use

Consider characteristics of the human population dependent on the resources of the affected area. Consider existing land and resource use in the area of, and influenced by, the proposed development and its ancillary activities; show same on a map of appropriate scale; indicate areas of special status (ecological reserves, native land reserves, villages, fishing stations, camp sites and gathering areas) and of potential special status (such as areas proposed under the International Biological Program and areas of paleontological finds). Consider traditional land use patterns (native hunting, fishing and areas of religious and cultural significance) and identify their significance; provide an inventory of archaeological and historic sites.

Consider recreational use of land and resources and discuss their potential development

3.8 Aesthetics and Recreation

Consider the aesthetic features of the area, especially those which are unusual.

3.9 Summary

Summarize concerns raised and measures available to alleviate those concerns.

Identify the more important concerns for detailed discussion in section 4.

IMPORTANT ENVIRONMENTAL IMPACTS

Significant environmental impacts will be discussed by issue in this section. Describe the potential impacts, the amelioration and mitigation measures proposed, and define the residual impacts.

By way of example, issues which may be identified as a result of completion of chapter 2 are:

a) changes in vegetative cover including effects on habitat

b) disruption of terrain

c) alteration of water regimes including the effects on habitat of fish and waterfowl

d) interference with wildlife populations

e) land use changes

SUMMARY

Summarize all issues and discuss pertinent findings and major concerns. List all proposals made to minimize or mitigate undesirable impacts. Document all residual environmental impacts.

APPENDIX A

PROJECT DESCRIPTION CONSIDERATIONS

The environmental engineering and design methodology and scheduling, concerning all aspects of the gas development system facilities and activities, should be detailed as they relate to environmental quality and safety. Engineering and design data should be integrated with the environmental aspects as much as is possible.

The overall design data provided should include orthophoto mapping of the horizontal alignment at a scale of 1 inch:1000 feet with 5 foot contour intervals and plan profiles of the vertical alignment, for all pipelines, feeder lines, plant locations, well clusters, roads, airstrips and borrow areas.

Maps should be provided showing geotechnical data (soil material, permafrost conditions, ice content) based on detailed drill or geophysical testing, surface and subsurface water movement, vegetation types, wildlife habitat, fish resources and archaeological sites in relation to the proposed facilities.

Mapping scales should be consistent with the requirements of the DINA application. These are:

(a) General Plan - 1:250,000 e.g. Land Use Information showing:

  i) existing features

  ii) project features

(b) Location Plans - detailed plans on orthophoto mapping

  1" = 1000' for above information

(c) Orthophoto mapping at a scale of 1" = 200' with 5' contour lines showing horizontal alignment of pipelines, roads, airstrips, etc. together with vertical alignment and typical construction drawings to cover right of way and lease areas only.

(d) Wildlife habitat, geotechnical, environmental feature, land forms, vegetation, etc. on a scale of 1 to 50,000.

. Waste and Toxic Materials

Consider expected releases, discharges or stockpiles of waste or toxic substances generated during all phases of the gas development which could be identified as potential air, land or water contaminants.

(a) the quality and quantity of liquid and solid by-products of well drilling and gas production, their storage, disposal and ultimate fate;

(b) methods of waste disposal to avoid health hazard to humans and degradation of the environment; information should be provided on water requirements from streams, springs or lakes including volumes, seasonal times of extraction, treatment and disposal for domestic, camp or construction purposes; location of camps and sewage disposal systems, anticipated disposal rates relative to local drainage patterns, quantities of solid waste and sites for disposal should be provided;

(c) the nature, transportation, storage, use, treatment and final disposition of any pesticides, herbicides, pipe coating materials, anti-corrosion materials, flushing agents, testing fluids, special lubricants and other toxic substances, proposed for the project and information on their expected persistance, mobility and ultimate fate in the surrounding ecological system:

(d) atmospheric emissions during all phases of the project: quantities and qualities of sulphur compounds, hydrocarbons, nitrogen oxides, water vapour, heavy metals, thermal emissions, and any other potential pollutants;

(e) other atmospheric emissions such as dust, noise pollution, and odour produced by H_2S and other by-products.

2. Contingency Plans

(a) how the possible loss of oil or gas through production, gathering, transmission or storage system would be routinely detected and stopped quickly. The maximum potential undetected loss from any part of the system should be calculated (this value is to be as low as is technologically feasible);

(b) how oil, gas and other toxic substances which have escaped into the terrestrial, lake or marine environment would be detected, how they would be disposed of and how the elements of the environment affected by the toxic material would be rehabilitated;

(c) methods to prevent burning of vegetation and proposals for a general contingency plan for fire prevention and suppression on the right-of-way, on the immediately surrounding land, and on lands involved in ancillary activities during construction, operation, and abandonment phases of the project.

3. Abandonment

(a) plans to show what equipment and facilities will be removed when the development is abandoned, how they will be removed and how the area will be stabilized or reclaimed after removal;

(b) plans for the disposal and rehabilitation of gravel pads and roads to prevent interference with the natural drainage;

(c) plans for the ultimate disposal of organic and mineral waste materials that were stabilized during the operational phase by freezing them into the permafrost;

(d) contingency plans concerning the release or loss of any gaseous, liquid or solid contaminants.